**Joe Hinson 6th/7th Grade Mathematics FCPS**

**Indicator(s):**

# MA.700.30.05 Estimate and apply measurement formulas (3. C. 1)

MA.700.30.10 Estimate and determine the area of quadrilaterals using parallelograms or trapezoids with whole dimensions (0-1000) \* (3. C. 1a)

MA.800.30.10 Estimate and determine area of composite figures with no more than 6 polygons (triangles, rectangles, or circles) by measuring, partitioning, or using formulas with whole number dimensions (0 to10,000) (3. C. 1b) \*

**Objective(s):**

Students will be able to determine the area of composite figures by estimating and applying measurement formulas within blueprints for a home of choice.

**Lesson Duration:** Two Days (A/B so 90 and 45)

|  |  |
| --- | --- |
| **Why?**  To provide a real-life application for the math indicators from the measurement unit to all students. Without providing this opportunity, students will struggle to understand the significance of recalling and using area formulas and understand their impact in everyday situations. | **How?**  Begin by providing the real-life problem that must be resolved:  Mr. Hinson and Mrs. Hinson have purchased a new home in Walkersville, MD. However, Mrs. Hinson is not happy with the carpet and flooring options in the home. If Mr. Hinson wants to surprise Mrs. Hinson by switching out the old flooring, what would he need to do? What questions should he answer?   * Are measurements of each room necessary? * How do you choose flooring options? * Does every room need flooring? * What about closets, bathrooms, and “other” rooms? * Should ALL the flooring be the same for each room? * Does finding the area of each room help? * What about waste when putting down flooring? * Should a budget for materials be considered? What about labor?   (Additional Activities – follow Activities page and scoring rubric) |
| **Proof (Assessment)**  Using a presentation format of choice, students will discuss their home blueprints, provide the total square footage, deliberate flooring options, and share the total cost for all their chosen flooring materials.  **Possible Presentation Options**  PowerPoint, Poster, Drupal, Blog, Active Inspire, Prezi, Google Presentation, or Your choice ☺ | **Notes/Reflection**   * Reteach this lesson in a different manner * Manipulatives should have been included or were needed * Students needed additional support * More real-life application required * Enrichment/Extension Menu was necessary * More opportunities for student engagement required * Students supported each other in groups * Full understanding of objective demonstrated in closing activity * Additional notes/ideas/student feedback… |

**Activities for the Area of Composite Figures Lesson**

**1st Activity**

* Research and identify a blueprint for a home that interests your taste and style.
* You may use one of the websites listed or use a search engine to identify a different website that has blueprints of homes.
* Requirements for the blueprints of choice
  + Your home must have two stories
  + It must include over 2500 finished square feet

**Websites for Blueprints**

* <http://www.homeplans.com/>; <http://www.thehousedesigners.com/>; <http://www.eplans.com/>; <http://www.builderhouseplans.com/>; Your choice ☺

**2nd Activity**

* Using your background knowledge on area of composite figures, you will need to determine the TOTAL square footage of your home and the square footage of each room, hallway, and bathroom.
* This information will be integral so you can complete Activity 3

**3rd Activity**

* Using the websites listed, choose flooring that will be laid in each room. Options can include: laminate, hardwood, composite, vinyl, carpet, or tile.
* Remember, EVERY room must have a flooring option (including bathrooms, hallways, closets, etc.)
* Choose wisely for your flooring options because you must stick to a budget of less than $7,500 in total for building materials. Be prepared to discuss your choices and rationale during your final presentation.

**Websites for Flooring**

* <http://www.homedepot.com/>; <http://www.lowes.com/>; <http://www.lumberliquidators.com/>; Your choice ☺

**4th Activity**

* Using a presentation format of choice, you will discuss your home blueprints, provide the total square footage, deliberate flooring options, and share the total cost of all flooring materials.

**Presentation Options**

* PowerPoint, Poster, Drupal, Blog, Active Inspire, Prezi, Google Presentation, or Your choice ☺

**Scoring RUBRIC for the Area of Composite Figures Lesson – House Flooring Cost**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Novice (1)** | **Apprentice (2)** | **Practitioner (3)** | **Expert (4)** |
| **Problem Solving** | No strategy is chosen, or a strategy is chosen that will not lead to a solution | A partially correct strategy is chosen, or a correct strategy for only solving part of the task is chosen.  Evidence of drawing on some previous knowledge is present, showing some relevant engagement in the task. | A correct strategy is chosen based on mathematical situation in the task.  Planning or monitoring of strategy is evident.  Evidence of solidifying prior knowledge and applying it to the problem solving situation is present with the RIGHT answer ☺ | An efficient strategy is chosen and progress towards a solution is evaluated.  Adjustments in strategy, if necessary, are made along the way, and/or alternative strategies are considered.  Evidence of analyzing the situation in mathematical terms, and extending prior knowledge is present with the RIGHT answer ☺ |
| **Reasoning and Proof** | Arguments are made with no mathematical basis.  No correct reasoning or justification for reasoning is present. | Arguments are made with some mathematical basis.  Some correct reasoning or justification for reasoning is present with trial and error, or unsystematic trying of several cases. | Arguments are constructed with adequate mathematical basis.  A systematic approach and/or justification of correct reasoning is present. This may lead to…  - clarification of the task  - exploration of mathematical phenomenon  - noting patterns, structures, and regularities. | Deductive arguments are used to justify decisions and may result in formal proofs.  Evidence is used to justify and support decisions made and conclusions reached. This may lead to …  - testing and accepting or rejecting of a hypothesis or conjecture  - explanation of phenomenon  - generalizing and extending the solution to other cases. |
| **Communication** | No awareness of audience or purpose is communicated or…  Little or no communication of an approach is evident or  Every day, familiar language is used to communicate ideas | Some awareness of audience or purpose is communicated, and may take place in the form of paraphrasing of the task.  Some communication of an approach is evident through verbal/written accounts and explanations, use o diagrams, or objects, writing, and using mathematical symbols  Some formal math language is used, and examples are provided to communicate ideas. | A sense of audience or purpose is communicated and  Communication of an approach is evident through methodical, organized, coherent, sequenced, and labeled response.  Formal math language is used throughout the solution to share and clarify ideas. | A sense of audience and purpose is communicated and  Communication at the practitioner level is achieved, and communication of argument is supported by mathematical properties.  Precise math language and symbolic notation are used to consolidate math thinking and to communicate ideas. |
| **Connections** | No connections are made. | Some attempt to relate the task to other subjects or to own interests and experiences is made. | Mathematical connections or observations are recognized. | Mathematical connections or observations are used to extend the solution. |
| **Representation** | No attempt is made to construct mathematical representations. | An attempt is made to construct mathematical representations to record and communicate problem solving. | Appropriate and accurate mathematical representations are constructed and refined to solve problems or portray solutions. | Abstract or symbolic mathematical representations are constructed to analyze relationships, extend thinking, and clarify or interpret phenomenon. |

A special thank you goes out to Exemplars for providing a sample math rubric that I modified…

<http://www.exemplars.com/assets/files/Standard_Rubric.pdf>